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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/852,582      | 05/09/2001  | Jithamithra Sarathy  | 312/12              | 5064             |

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KAPLAN & GILMAN, L.L.P.  
900NROUTE 9 NORTH  
WOODBIDGE, NJ 07095

EXAMINER

NGUYEN, JOSEPH H

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2815

DATE MAILED: 09/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/852,582

Applicant(s)

SARATHY ET AL.

Examiner

Joseph Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 and 18-33 is/are pending in the application.
- 4a) Of the above claim(s) 14, 15 and 20-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16, 18, 19 and 29-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 10 May 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 30-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 30-33 recite the limitation "said tuning region" in line 1. There is insufficient antecedent basis for this limitation in the claim. There is no such "tuning region" recited in claims 1 and 5 from which claims 30-33 depend.

Regarding claims 31 and 33, it is unclear the limitation "said means for selecting" since what exactly said means is selecting is not clearly defined.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 30, 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsui (JP Patent 363111679A).

Regarding claim 1, Matsui discloses on figure 3 a semiconductor device comprising "a buried grating [14]; a wave guide core [13], an absorption section [16] and a tuning section [18] for changing an effective index of said grating [14]".

Regarding claim 2, Matsui discloses on figure 3 "the device is integrated in a single optical circuit on a common substrate [11]".

Regarding claim 30, Matsui discloses on figure 3 "said tuning region [18] comprises means [17] for selecting a particular wavelength by changing said effective index of said grating".

Regarding claim 31, Matsui discloses on figure 3 "said tuning region [18] comprises an electrode [18], and said means [17] for selecting comprises means [17] for changing an electrical current input to said electrode [18]".

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Aoki et al.

Regarding claims 3 and 4, Matsui discloses on figure 3 substantially all the structure set forth in the claimed invention except the device length equal or less than 500 um and the device width equal or less than 100 um. However, Aoki et al discloses on figure 1A a semiconductor device having the device length equal or less than 500 um and the width equal or less than 100 um. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Matsui by having the device length equal or less than 500 um and the device

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width equal or less than 100 um for the purpose of simplifying the manufacturing method of a photo detector device.

Claims 5-13, 29, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chandrasekhar in view of Nitta et al.

Regarding claims 5-13, 29, Chandrasekhar discloses on figure 2 substantially all the structure set forth in the claimed invention except "a grating positioned between the substrate and the undoped region". However, Nitta et al discloses on figure 4 a grating 201a positioned between the substrate 201 and the undoped region 202. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chandrasekhar by having a grating positioned between the substrate and the undoped region for the purpose of improving the light emission efficiency of a photo-detector.

Regarding claim 32, Chandrasekhar discloses on figure 2 "said tuning region [22] comprises means [7] for selecting a particular wavelength by changing said effective index of said grating".

Regarding claim 33, Chandrasekhar discloses on figure 2 "said tuning region [22] comprises an electrode [22], and said means [7] for selecting comprises means [7] for changing an electrical current input to said electrode [22]".

Claims 16, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Rushing.

Regarding claims 16, 18-19, Matsui discloses the photo detector as set forth in the claimed invention. It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the photo detector as disclosed by Matsui into the data network disclosed by Rushing on figure 3 for the purpose of improving the photo detection efficiency in an electrical circuit.

### ***Response to Arguments***

Applicant's arguments filed 8/12/2002 have been fully considered but they are not persuasive.

With respect to claims 1 and 5, applicant argues that Matsui or Chandrasekhar never teaches or implies a tuning region for changing the effective index of the grating. However, as taught by Deacon (US 6373872 B2 cited herein as a reference), the effective index in the grating may be changed by one or more of several means including thermo-optic effect, electro-optic effect... (col. 13, lines 35-38). Matsui discloses on figure 3 an electrode 18 functioning as a tuning section. By injecting electric current through the electrode 18, the effective index of the grating 14 can be changed under electro-optic effect as taught by Deacon above. Similarly, Chandrasekhar discloses on figure 2 the electrode 22 functioning as a tuning section. By combining Nitta et al and Chandrasekhar, and by injecting electric current through the electrode 22, the effective index of the grating can be changed under electro-optic effect as taught by Deacon above.

With respect to new added claim 30, Matsui clearly discloses on figure 3 the tuning region comprises means 17 for selecting a particular wavelength by changing said effective index of said grating 14.

With respect to new added claim 32, Chandrasekhar clearly discloses on figure 2 the tuning region comprises means 7 for selecting a particular wavelength by changing said effective index of said grating.


***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30am-4: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703)-308-7382 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956

JN  
September 11, 2002



EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800